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Running Head: Expert consensus for classification in VI Football

Expert opinion on classification for footballers with vision impairment: Toward evidence-based minimum impairment criteria

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Expert opinion on classification for footballers with vision impairment: Toward evidence-based minimum impairment criteria

Abstract

In Para sport the aim of classification is to minimise the impact of impairment on the outcome of competition. Despite requirements of the International Paralympic Committee Athlete Classification Code for classification to be evidence-based and sport-specific, sports for athletes with VI, including football, use the same generic classes across almost all sports. The aim of this study was to consult with experts to establish the needs and challenges for developing a code-compliant system of classification for VI football. A panel of 18 experts with international experience in VI football (16.8 ± 10.2 years) took part in a three-round Delphi study using online surveys. Results showed that the panel did not think that the current system completely fulfils the aim of classification. The panel identified measures of visual function they considered to be relevant but are not currently measured during classification including dynamic acuity, depth and motion perception, and contrast and light sensitivity. Moreover, they identified technical skills such as ball control, dribbling and passing, as well as perceptual-cognitive skills, as most likely to be affected by vision impairment. Findings outline the need for change and offer a framework for future research to develop evidence-based classification for VI football.

Keywords: Paralympic; classification; football; vision; Delphi

Introduction

Fairness is a key consideration when developing legitimate sporting competition. For example, boxers are grouped only to compete against other fighters of a similar weight. This process is known as *classification.* The key goal of classification is to make sport fairer; meaning the athlete's weight, age, gender, or impairment should have minimal influence on the outcome of competition. Similarly, para-athletes are grouped to compete in classes with others who have impairments that have a similar impact on performance, with the goal to minimise the impact of eligible impairment types on the outcome of competition (Tweedy et al., 2014; Tweedy & Vanlandewijck, 2011).

Understanding the *impairment-performance* relationship for specific impairment types in a given sport is important in legitimizing competition for Para sports. This should be specific to how impairment impacts performance during competition in that particular sport (International Paralympic Committee, 2015c). In the past, classification has been based on grouping by the nature of impairment. However, this approach does not account for the relationship between performance and impairment in the specific sport in which an athlete is competing. The IPC Athlete Classification Code now requires all sports to develop sport-specific classification systems that are based on research evidence quantifying the impact of impairment on performance.

Classification research has a much longer history in sports involving physical, and to some extent cognitive impairments, than it does for athletes with vision impairment. For example, the impairment-performance relationship has been investigated in wheelchair racing (Beckman et al., 2014; Vanlandewijck et al., 2011) and team sports such as wheelchair basketball (Vanlandewijck et al., 2003), wheelchair rugby (Altmann et al., 2014) and cerebral-palsy (CP) football (Pastor et al., 2019; Reina et al., 2016, 2018). Research in CP

52 football has developed a number of sport-specific performance tests. This has led to the
53 implementation of a new classification system, and also evidences the need to consider the
54 link between the classification system and the sport rules. For example, in CP football rules
55 are in place regarding the number of players of a certain class that can be on the field at any
56 one time. In other team sports such as wheelchair basketball and rugby, the classification
57 process assigns a point score to players with a sport rule on the maximum number of points
58 allowed on the court at once.

59 Sports for vision impaired (VI) athletes have made slower progress. The majority of VI
60 sports are currently classified in the same way using a system originally based on the World
61 Health Organisation definitions of low vision and blindness (WHO; World Health
62 Organisation, 2004). The current class system that now differs slightly from WHO definitions
63 can be found in table 1. B1 athletes are effectively blind, with some having very rudimentary
64 vision (e.g., the ability to perceive light vs. dark). The B2 and B3 classes include athletes that
65 have more sight.

Table 1. Current classes based on visual acuity and visual field, LogMAR 1.0 represents the current MIC.

Class	Visual acuity (LogMAR)	Visual field (radius)	Description
B3	1.0 to 1.4	Less than 20 degrees	Limited visual acuity and/or visual field in both eyes.
B2	1.5 to 2.6	Less than 5 degrees	Severely limited visual acuity and/or visual field in both eyes.
B1	Poorer than 2.6	Cannot be B1 with only loss of visual field	A player can typically distinguish only light from dark or is not able to perceive light.

66

67 A previous Delphi study that consulted an expert panel across a variety of VI sports found
68 that, at present, VI sports do not currently achieve the stated aim of classification - to

minimize the impact of impairment on the outcome of competition (Ravensbergen, Mann, & Kamper, 2016). Progress has begun with the International Blind Sports Federation (IBSA) and the IPC publishing a joint consensus statement that outlines research models for the development of evidence-based sport-specific classification for VI sports (Mann & Ravensbergen, 2018). This statement outlined key considerations in classification research including the impact of sport rules, blindfolds, guides, procedures for evaluating vision, and developed models for undertaking classification research. Building on this, a number of individual sports such as shooting (Allen et al., 2016, 2018, 2019; Myint et al., 2016), swimming (Ravensbergen, Genee, & Mann, 2018) and judo (Krabben et al., 2018, 2019) have begun to develop evidence bases for classification. However, challenges remain for the VI version of the world's most popular sport, football.

In order to develop an evidence-based and sport-specific classification system for any VI sport, research is required to investigate what should be the minimum impairment criteria (MIC; Mann & Ravensbergen, 2018). The MIC in any sport refers to the least amount of impairment that has an impact on performance in the specific sport (International Paralympic Committee 2015a; 2015b). For example, the MIC in VI football should be the minimum level of vision impairment that decreases performance when competing with sighted players and therefore should qualify them to compete in the para version of the sport. Once the MIC is established, and there is a clear understanding of who is eligible to compete in VI football, these eligible players can be best grouped into sport classes (International Paralympic Committee, 2015c; Mann & Ravensbergen, 2018).

In the current structure of VI football, the separate classes are often thought of as two different sports (blind and partially-sighted football). B1 athletes compete separately while wearing blindfolds and using a ball with sound and 'kickboards' on the sides of the pitch/court. B2 and B3 athletes compete together without adaptations such as blindfolds or

sound in the ball, instead relying on their remaining sight. This means that, currently, one class plays a game based largely on the use of sound, while the others play based on the use of their sight. This is similar to other VI sports that do not consider different classes as separate sports. For example, in swimming, B1 uses blackened goggles, and in athletics some runners in B2 and all in B1 use guide runners, but B3 do not. Football may be viewed differently because slightly more adaptations are used (the court, goals, and ball are different), or because, unlike other sports, one class is in the Paralympic Games and the others are not. Despite this, according to the IPC definition of an MIC (International Paralympic Committee 2015a; 2015b), and IBSA's classification procedures, there is actually only a single MIC used to establish whether a player is eligible to compete in VI football (currently LogMAR 1.0; see Table 1). Rather than having a separate MIC for the B1 version of the sport, class boundaries establish whether the player should be allocated a B3, B2 or B1 class. Adaptations are then added to enable the players who cannot compete with sight (B1) to compete with sound.

According to the IPC and IBSA's joint position stand on classification, it is crucial for this single MIC to be established in research using the *unadapted* form of a sport (Mann, & Ravensbergen, 2018). This has important implications in particular for blind football. Consider if this rule were not the case and instead that the MIC was investigated using the B1 version of the sport. It would in all likelihood be impossible to establish a relationship between impairment and performance. Because all athletes wear a blindfold in the B1 class, then even fully sighted individuals would appear to be impaired and would become eligible to compete. Instead, during research, the MIC should be established using the unadapted form of the sport whereby those with impairment are found to have a genuine decrease in performance (Mann, & Ravensbergen, 2018). Without the adaptations in place, the most suitable 'unadapted' form of VI football for all current classes, is futsal.

There are also challenges when aiming to establish the impairment-performance relationship in a team sport. In individual sports, such as swimming or shooting, performance can be measured in a fairly unambiguous fashion using race times or scores. In team sports, such as football, there is need to understand how impairment impacts a variety of performance variables that may be significantly less defined than a race time. For instance, an individual's own passing performance will impact the team's overall possession and chance of winning. Research is required to establish the degree to which vision impairment would restrict these skills irrespective of the amount of practice an athlete might perform. Furthermore, there is a need to gain an understanding of how changes in each of those aspects of an individual's performance may impact the performance of the team.

Developing an evidence-based classification system in a sport in which little to no previous research has been conducted presents a challenge. This can be addressed, at least in part, by consulting experts who possess experiential knowledge in that sport. In the past, Delphi studies have been performed as a structured and systematic method of garnering expert opinions on a topic of interest (Hasson et al., 2000; Hasson & Keeney, 2011; Thangaratinam & Redman, 2005). In some circumstances the approach is used to gain consensus from experts but in this context, while understanding the level of agreement is useful, the primary focus is to use a systematic approach to elicit opinions to guide future research. The IPC requires a sport-specific athlete-centred approach, and using the Delphi process from the outset allows for the structured input of athletes and coaches involved with the specific sport; an approach that is recommended in the IPC/IBSA joint position statement for research into classification for VI athletes (Mann & Ravensbergen, 2018). The primary goal of research into classification is to underpin the continued development of fairer systems that the international federations will implement, and athletes will accept. Other sports that have begun to work towards evidence-based classification have used this process as a

valuable starting point (Krabben et al., 2019; Ravensbergen et al., 2018; Ravensbergen et al., 2016). However, due to the need for sport-specific evidence, further consultation is required with experts in VI football specifically. The aim of this study was therefore to establish expert opinion on the needs of a sport-specific classification system for VI football, with a specific focus on guiding research to develop evidence-based MIC.

Method

Participants

A total of 18 participants (16.8 ± 10.2 years experience in international VI football, see Table 2) formed the panel for this study. Due to the need to consider the unadapted form of the sport to develop a single MIC for all classes and to ensure all perspectives were heard, panellists with experience in both current B1 and B2/3 classes were included. The number of participants and level of expertise was chosen based on previous research that has conducted expert consultations in similar populations (Krabben et al., 2019). Skulmoski, Hartman and Krahn (2007) also suggest that 10-15 participants is an appropriate size for a Delphi study in a fairly homogenous sample. The panel was invited in consultation with the International Blind Sport Federation (IBSA) who are the international sports federation responsible for the administration of VI football. Panellists were required to have experience at international level as a VI athlete (current or retired), coach, classifier, administrator (e.g. performance director or classification lead) or referee (Table 2). Several panel members occupied multiple roles. Panellists were recruited internationally and agreed that they had sufficiently proficient English language skills to read and respond to the surveys. All participants provided informed consent prior to taking part in the study. The university ethics committee granted ethical approval.

Table 2: Panel Characteristics

	N(%)
Continent	
Asia	5(28)
Europe	10(56)
South America	2(11)
Oceania	1(6)
Role in VI sport*	
Administrator	3(17)
Athlete	5(28)
Coach	7(39)
Classifier	2(11)
Referee	1(6)
Current class involvement	
B1 only	5(28)
B2/B3 only	2(11)
Both (B1 and B2/B3)	11(61)
Years of experience	
0-5	4(22)
6-10	2(11)
11-15	2(11)
>15	10(56)

***Primary role if multiple roles were reported.**

Procedure

In order to access an international sample, a version of the Delphi process using online surveys was selected. Over a period of six months panellist responded to a series of three surveys that posed questions on a variety of topics via online survey software (Qualtrics Research Suite, Qualtrics, Provo, UT, United States). Panellists were then given three weeks to respond to each survey, with approximately one month elapsing between each survey. The full list of questions and responses can be found in the Supplementary Table 1.

Consensus. Delphi studies are often used to reach a consensus agreement on a topic, and while the primary purpose of this study is to guide future research for classification, it is still useful to be clear about when consensus is reached on a topic. There has been a range of consensus levels from 50 to 80% in previous Delphi studies (Hasson et al., 2000), with some suggesting rating different levels of consensus as low, medium or high (Biggin et al., 2017).

Based on previous work in the area and the nature of our sample we set 70% agreement, equating to 13 out of 18 responses, as the level at which consensus was reached. This is a medium to high level of consensus. Participants who did not feel qualified to answer a question were removed from consensus calculations.

Survey Design. The first survey was designed based on previous work in classification for VI sport. This included the pertinent topics identified in previous Delphi surveys from VI sport and the IPC/IBSA joint consensus statement on classification in VI sport (e.g. Krabben et al., 2019; Mann & Ravensbergen, 2018; Ravensbergen et al., 2018; Ravensbergen et al., 2016). For example, although not strictly a classification issue itself, the placement of guides is an adaptation to the sport that needs to be accounted for in classification research. The surveys consisted of a series of multiple-choice questions that asked whether participants believe statements made about classification issues (options: 'Yes', 'No', or 'I don't feel qualified to answer this question') and allowed for qualitative comments to explain answers to add further opinion. Participants were given detailed explanations in lay language prior to answering any questions that included reference to current procedures, policy, or terminology that may not be familiar. For example, current MIC, current sport classes, measures of visual function, and aspects of performance were clearly defined and explained prior to questions appearing in the relevant sections.

Following the first round, any questions that reached 70% consensus were considered to be resolved and not asked in subsequent surveys. For the second and third surveys further questions were developed based on topics that did not reach consensus, and the qualitative comments provided in all sections in the previous round. To design these further questions the lead researcher identified key themes that were mentioned by more than one panellist for each question. These themes were then reflected upon with a co-author who had significant prior experience in the Delphi process in VI sport. These authors then designed the questions

for the following round to address key issues identified by the panel. Previous questions lacking consensus were reworded based on comments from the panel. When responding to the second and third surveys, participants were presented with findings from the previous round and were then asked the further questions that had been developed.

Aspects of Football Performance. Various studies have tested technical aspects of the game in isolation (e.g. Ali et al., 2007) but there has been little work done to understand how these affect the likelihood of a team winning a game. To start to identify potential links between measurable individual performance variables and team performance, we utilised a Work Domain Analysis for football conducted by McLean, Salmon, Gorman, Read, and Solomon (2017). This technique aims to produce an in-depth description of the system under analysis. This analysis produced four 'functional purposes' of the sport: (i) achieve desired result; (ii) implement game plan; (iii) play in line with club ethos; and (iv) progressive team improvement. The analysis then identifies values and priority measures that underpin these purposes. Since classification should only be conducted based on the impact of impairment on the outcome of competition, we focused on 'achieve the desired result' and the priority measures leading to this. Because VI football is a modified version of futsal, we worked with both a futsal and VI football coach and a former head of sport science from an international football team. We discussed the priority measures that are relevant to futsal and the aspects of individual performance that would underpin those desirable team outcomes. During this process we also made sure to include aspects from the English FA's *four-corners model* that identifies technical, tactical, social and psychological underpinnings of an individual's performance. This group and the lead author met in person and agreed on an original list of possible aspects of performance that could be used in the first round of the survey when questioning the panel on this topic. All aspects of performance identified by the researchers and the panel appear in Table 3.

Results and Discussion

Eighteen experts participated in the first round, 15 in the second round, and 14 in the third round. Dropout occurred when a panellist failed to respond to a survey and any follow-up communication. In the event that a participant partially completed a survey, they were contacted and asked to complete it. If this was unsuccessful, only completed answers were included in percentage calculations. Participants were reminded before each survey that they should consider football for all VI athletes, rather than just B1 or B2/B3 athletes, unless prompted otherwise. The surveys consisted of ten sections based on the needs for developing an evidence-based classification system for VI Football (Mann & Ravensbergen, 2018; Ravensbergen et al., 2016).

1. Aims of classification

The panel were first asked whether they believed that the way vision impairment is currently classified in IBSA Football fulfils the aim to minimise the impact of the eligible impairment on competition (Tweedy & Vanlandewijck, 2011). In the first round 61% agreed the aim is only partially fulfilled and 17% believed the aim is not fulfilled at all. The remaining 22% believed the aim is fulfilled. This means that 78% of the panel agreed that the current system does not fully meet its aim and change is needed to improve the legitimacy of competition in VI football. A number of key issues were raised here in the qualitative comments including: (i) the subjective nature of vision tests with the requirement of honest responses from participants; (ii) a potential need for observation of function in football (observing whether athletes are using sight in the game) and daily living (are athletes reading signs or text on mobile phones?); and, (iii) most strikingly, there being no competition available for some B2 players who are too impaired to compete in the B2/B3 competition, but are not eligible to compete in the B1 game. These issues were explored further in other more

relevant sections of the survey (e.g. intentional misrepresentation, classification test procedures and sport classes).

Summary. At present the classification system in VI football does not fully meet the aims of the Paralympic movement to minimise the impact of impairment on the outcome of competition. Key issues relating to misrepresentation, classes and test procedures have been identified. Research is required to produce a more legitimate evidence-based system of classification.

2. Minimum Impairment Criteria

In this section panellists were asked about the existing minimum level of impairment required to take part in VI football. In Round 1, there was no consensus (63% agreed) that the current MIC for visual acuity represents the least severe level of vision impairment that would decrease performance. Only 55% agreed for visual field. 39% of panellists did not feel qualified to comment on the MIC for visual field or visual acuity in Round 1. In the second survey panellists were asked whether the current MIC allows players to compete whose impairment does not truly impact their football performance. While 33% of the panel did not feel qualified to comment, those who did respond reached consensus (70%) that the current MIC for visual acuity does allow athletes to play whose impairment does not impair football performance. This suggests there may be players involved in VI football who should not be eligible to play the sport. The panel did not reach consensus about whether the current MIC for visual field allows for players to compete whose impairment does not impact performance (60% agreed). In the third round 79% of the panel agreed that any impairment at all to a player's visual field would have a negative effect on football performance.

Summary. Responses and comments suggest a lack of understanding and consensus around the established MIC and how it is related to performance. Consensus was reached that there

are eligible players whose impairment does not truly affect their performance. The number of panellists who did not feel qualified to answer in this theme may stem from a lack of evidence about the impairment-performance relationship in football, a lack of understanding of the MIC itself, and/or a lack of familiarity with B2/B3 football for some in B1 football. These findings will guide further research to develop an evidence-based MIC for VI football and suggest resources should be provided for those involved in the sport to enhance understanding.

3. Sport Classes

Once an athlete meets the minimum impairment criteria, they are allocated a sport class based on the severity of their impairment (currently B1, B2 or B3 in most VI sports). Many other team Para sports do not compete in separate classes but instead employ a points system that allows all levels of impairment to compete together and includes a maximal number of points to be on the court per team at any one point in time. Less impaired athletes typically represent a higher number of points to improve the opportunities for athletes with more severe impairments. In the first survey, panellists were initially asked whether they believed that separate classes are necessary for VI football. 89% of the panel agreed that classes are necessary. However, when asked whether a points system that combined the current B3, B2 and B1 into a single competition would be desirable, 72% agreed that it would not. The key reasons focussed on player safety and the opinion that the B1 players would be at a significant disadvantage. However, a number of panellists suggested that a points system might be a positive idea for the current B2/B3 (partially-sighted) game. In the second survey, 71% of the panel agreed that a points system would improve the equity of impact of impairment on team performance in the current B2/B3 game.

When asked in the first survey whether a team of current B3 players would beat a team of B2 players, 100% of the panel agreed they would. Similarly, 100% of the panel agreed that a team of B2 players would beat a team of B1 players if none of the current B1 adaptations were in place (e.g. blindfolds, sound in the ball and kickboards around the pitch). Panellists were then asked whether the impact of impairment on performance is reasonably similar for all footballers within each of the individual classes. Consensus was not reached for any of the current classes (B1, 53% yes; B2, 63% no; B3, 69% yes). The issue of variation in performance within classes appears higher for the more severely impaired athletes. In the second survey panellist were asked to respond as if all athletes had been classified fairly, 86% of the panel agreed that in that case the B3 class would have comparable impact of impairment on performance.

In Survey 1 a number of panellists raised the issue of the most severely impaired B2 players in the current system not being able to compete in either competition. When asked if the current B2 players could compete equitably in the B2/B3 partially sighted game if additional adaptations were added, 79% agreed they could not. When asked if those severely impaired B2 athletes could compete equitably in the B1 competition with all adaptations in place, 71% agreed they would. The majority of the panel (85%) preferred broadening the B1 competition to include the most severely impaired B2 players to be the most suitable solution for those players who are too impaired to compete in the B2/B3 but not impaired enough for B1 competition. This does, however, raise the issue that these players would then need to wear a blindfold and would be unable to utilise their remaining sight.

Summary. The panel agreed that a class system is required in VI football, but that the current classes allow too much variation in the impact of impairment on performance within the classes. Panellists felt that the more impaired B2 players couldn't compete equitably in any current form of competition.

4. Measures of Visual Function

All VI sports, aside from shooting, use only visual acuity and visual field to measure an athlete's eligibility to compete. However, there are many other aspects of visual function which may also be relevant to the sport that are not currently measured during classification. For example, contrast sensitivity has been shown to be important for performance in VI shooting (Allen et al., 2018) and is now subsequently incorporated into the classification system for shooting. In Round 1 panellists were first asked whether they believed that visual acuity and visual field are appropriate ways to assess the impact of VI on football performance. Panellists agreed both measures were suitable (acuity 92%; field 93%). However, when asked if they believed these are the only measures of visual function that should be used in classification, 91% of the panel agreed they are not. The panel then rated the importance to football performance of a selection of other visual functions that were defined for them. Again, visual acuity and visual field rated highly, with agreement that those measures are very or extremely important to football performance (88% and 84% agreement respectively). Furthermore, 75% of the panel agreed contrast sensitivity and dynamic visual acuity are also very or extremely important. A number of other measures of function came close to consensus in Survey 1, including depth perception (69%), motion perception (69%) and light sensitivity (69%). Therefore, in the second survey participants were asked to rate whether the measures that had not reached consensus and the additional measures mentioned in the comments were important enough to include in classification. Results are presented in Table 3.

Summary. While visual acuity and visual field are likely to be important, the panel clearly supported the need to establish whether additional measures of visual function, which are likely to impact football performance, should be assessed during classification. Future research should account for these and look to establish whether a single overarching measure

of function or different combinations of measures are most effective for classification in football. This process led to the inclusion of contrast sensitivity for the first time in VI classification for shooting (Allen et al., 2018).

Table 3: Importance ratings for measures of visual function given in the second survey.

Measures of visual function	Important enough to include in classification
Dynamic visual acuity	75%
Depth perception	75%
Motion perception	75%
Contrast sensitivity	73%
Light sensitivity	70%
Eye coordination	30%
Colour vision	18%

5. Classification Test procedures

VI classification is currently based on the test results from the eye with the best visual acuity and/or visual field whilst wearing optimal optical correction (e.g. spectacles or contact lenses). This means the athletes who have spectacles or contact lenses must wear them during classification, regardless of whether they use them during competition. The panel agreed (73%) that classification should be based on the test results with best possible optical correction if a classifier judges that correction could be reasonably used during play. In round 1 the panel failed to reach consensus on whether classification should be based on the results of the best eye (36%) or both eyes together (64%). In this section the main qualitative comments raised were based on two key themes (i) the use of observation (classifiers viewing players in activities outside of the standardised vision tests) during classification and (ii) the need for test conditions during classification to represent game play as closely as possible.

In survey 2, following further explanation that the results from a single eye can be either better or worse compared to both eyes, 93% of the panel agreed that classification should be based on both eyes together. When questioned further about observation, 80% of

the panel believed that independent and *objective* information about the level of an individual's impairment could be obtained through the process of observation. However, the panel did not reach consensus as to whether this would add to standardised vision testing and in what setting any observation should take place. In the final survey the panel reached consensus that, even if standardised vision tests were as objective as possible, observation could still add to the assessment (77%).

Summary. Panellists believed that testing should take place with the athlete wearing their best possible optical correction, if the classifier deems it can be used during competition, and should also be based on the results when testing both eyes together. Panellists felt that observation may add to what can be measured using standardized vision tests.

6. The Impact of VI on Aspects of Football Performance

In order to experimentally establish the impairment-performance relationship, it is important to understand which aspects of performance are likely to be affected by VI so appropriate dependent measures can be assessed. This is a key challenge in team sports where the impairment-performance relationship must be considered for individuals, while understanding how changes in performance would affect the likelihood of the team winning. Despite the wealth of football related literature in the domain of performance analysis, there is no consensus on, or model of, key determinants of successful performance.

Aspects of Performance Negatively Impacted. In the first survey the panel were presented with a list of aspects of football performance and asked whether they believed VI would affect these, either positively or negatively, and whether there were any possible aspects or performance they would like to add. However, consensus was not reached on which aspects would be affected either negatively or positively. Some further aspects were suggested in the qualitative comments. In survey 2, the question was reworded, and the

panellists were asked if they believed vision impairment would lead to a limitation in each of the aspects of performance. The final list of aspects of performance is displayed in the 'aspects of football performance' column in Table 4. Consensus on whether these aspects are affected by VI is displayed in the 'negatively affected by VI' column in Table 4.

Aspects of Performance Affected First. Since the goal of establishing an evidence-based MIC is to find the minimum level of impairment needed to impact performance, we first needed to establish which aspects of performance would be first affected by VI. Therefore, in round 1 panellists ranked the aspects of football performance that they thought would be affected if a player began to develop vision impairment, with a rank of one for the first aspect of performance affected and twelve for the last. These are displayed in the 'earliest affected' column of Table 4. Panellists suggested in comments that 'movement' and 'executing set plays' would also be affected.

Aspects of Performance Most Important to Winning. In round 2, to establish how an impairment of individual performance will affect team outcome, panellists were asked to rank the original aspects of performance plus the two suggested additions (movement and set plays) from those most (rank 1) to least (rank 14) likely to impact the chance of winning a match. These rankings are displayed in Table 4 in the 'importance to winning' column.

Summary. Technical skills of ball control, dribbling, and passing, as well as perceptual-cognitive skills of spatial awareness, anticipation, and decision-making, were ranked as the most likely to be affected by VI and are the most important for winning a game. The aspects of performance that the panel agrees would be negatively affected by VI, and are the earliest affected and most important to winning, should be prioritised in research into the MIC and sport class allocation.

Table 4: Aspects of football performance ordered by the combined mean rank of first to be affected by VI in round 1 (1first – 12 last) and combination of importance to winning in round 2 (1 most important – 14 least important). Aspects with agreement on being negatively affected by VI are in grey.

Aspect of football performance	Negatively affected by VI (%Yes)	Earliest affected (Mean rank)	Importance to winning (Mean rank)
Ball control	86	4.1	2.4
Dribbling	71	6.0	4.6
Passing	86	4.6	6.6
Spatial awareness	86	5.9	5.7
Anticipation	86	5.2	6.4
Shooting	57	6.9	5.2
Decision-making	71	6.7	5.6
Movement	79	-	7.3
Agility	50	7.6	8.6
Executing set plays	86	-	8.6
Attacking tactics	93	10.4	8.8
Communication	29	9.1	10.4
Sprinting	36	9.2	10.4
Defensive tactics	86	11.6	9.4

7. Congenital and Acquired Impairments

Previous work investigating issues in VI classification has identified the age at which an athlete acquires an impairment as a potential issue for consideration (Ravensbergen et al., 2018; Ravensbergen et al., 2016). The panel did reach consensus (88%) in survey 1 that the age at which impairment is acquired should not be taken into account in classification, and 100% agreed players with congenital and acquired impairments should compete together.

When questioned further on this issue, our panel nearly reached consensus that the age at which impairment is acquired influences the impact of the impairment on performance (69%). However, there was disagreement on whether a congenital (27%) or acquired (33%) impairment would have an advantage or if the impact would be the same (40%). In round 2 consensus was nearly reached again for a different question, with 69% of the panel agreeing that with extensive training VI athletes with the same level of impairment are able to reach the same skill level regardless of when the impairment was acquired. When questioned on

whether the benefits during classification of accounting for when the impairment was acquired would outweigh the complexity of inclusion in classification, there was no consensus for either B1 (62% no) or partially sighted (69% no) competitions.

Summary. The panel failed to reach agreement on whether a player with a congenital or acquired impairment would have an advantage. However, there was consensus that this should not be accounted for in classification.

8. Goalkeepers and Guides

In both of the existing competition classes, goalkeepers are not required to have vision impairment and so they effectively act as guides while also actively taking part in the game. Furthermore, coaches can verbally guide players when the ball enters the middle third of the field, and a third guide is placed behind the opponent's goal that aids with attacking play such as using sound to locate the goal for shooting. The panel agreed that these goal guides are necessary for functional game play in both B1 (93%) and B2/B3 competitions (71%). Similarly, the panel agreed that goalkeepers without impairment are also necessary for functional game play in B1 (93%) and B2/B3 competitions (73%). In sum, 93% of the panel agreed that the goalkeeper can make a significant contribution to team performance, but only 60% agreed that a VI team could win a game simply because they have a highly-skilled sighted goal-keeper. In survey 2 the panel confirmed that they believe the rules for goalkeepers should remain the same for both B1 (92%) and B2/B3 (93%) competitions. A majority (73%) also agreed that a B2 player would need a goal guide in order to be able to score. The comments following these questions focused on goalkeepers and guides playing a significant role in player safety and enhancing the quality of the game.

Summary. The panel believes that the rules relating to guides and goalkeepers should remain the same.

9. Blindfolds

Footballers who play in the B1 competition are required to play with blindfolds irrespective of any remaining vision they may have. The B2/B3 players play without blindfolds. The use of blindfolds is a contentious issue across VI sport (Mann & Ravensbergen, 2018). In round 1, 100% of the panel agreed that blindfolds are a fair way of equalising the impact of impairment on performance for players in the B1 class (i.e. to equalise those with some and those with no remaining functional vision). The panel did not reach consensus on whether blindfolds should be worn by all players if a single competition for all classes were to be created (38% no, 62% I don't think a combined competition is feasible at all). The panel also did not reach consensus (25% yes, 44% no, 31% it depends on the player) on whether B2/B3 players would want to compete with B1 adaptations such as blindfolds if it enhanced their likelihood of competing in the Paralympic Games (all B2/B3 players on the panel said they would not).

In survey 2, to address the issue of the most severely impaired B2 players lacking adequate competition, the panel were asked if blindfolds would still be a fair way to equalise the impact of impairment on performance if the evidence suggests they should be placed in the B1 competition. 93% agreed it would be.

Summary. The panel believes blindfolds are a fair way to create equitable competition in the current B1 class.

10. Intentional Misrepresentation

Intentional misrepresentation (IM) refers to when athletes make themselves appear to be more impaired than they actually are by deliberately under-performing during classification tests. This is a serious offense and can incur strong penalties due to the potential impact on the legitimacy of Para sport (IPC, 2015). IM is a particular issue in VI sport

because vision tests are based on athletes reporting what they can see. Here, in round 1, 87% of the panel agreed that IM occurs in VI football. Furthermore, 100% agree that it remains necessary to use blindfolds in B1 football to prevent IM. In addition, 93% of the panel agreed that the classification process should improve to minimise IM. Qualitative comments suggested potential solutions and improvements in the system that could address issues related to IM. In survey 2 the panel were given these possible interventions and asked to rate how effective they might be (Table 5). Two of the most effective, namely (i) consistent qualifications for classifiers, and (ii) transparent procedures, seem feasible in the shorter terms. However, introducing more objective vision tests may require a significant body of research.

Summary. The panel believes that intentional misrepresentation does occur in VI Football but can be countered with a number of possible changes to the classification process.

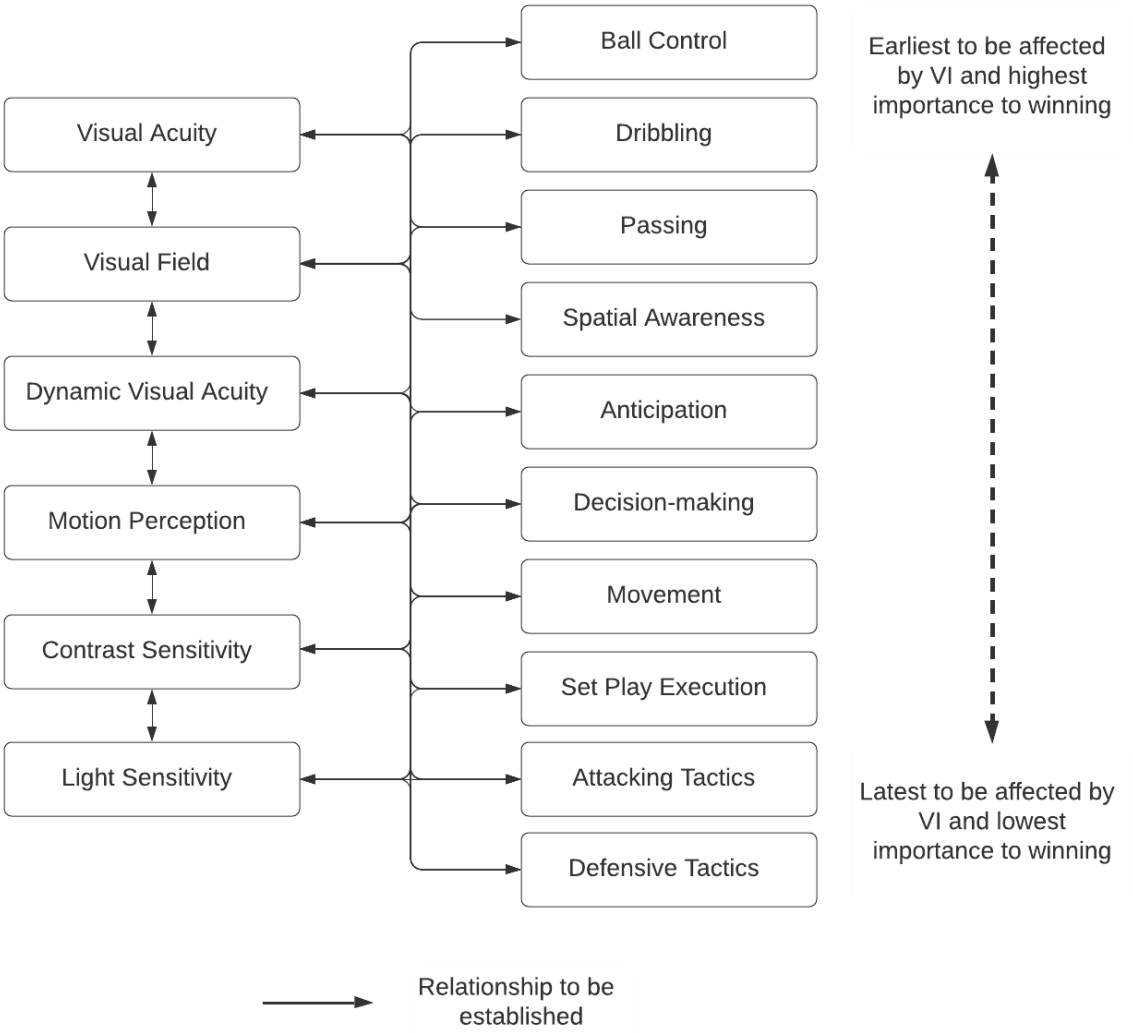
Table 5: Methods to address intentional misrepresentation and their possible effectiveness from highest to lowest

Methods to address intentional misrepresentation	Extremely effective	Very effective	Moderately effective	Slightly effective	Not effective at all	Level of consensus
Require consistent qualifications across all classifiers	60%	40%	0%	0%	0%	100% very to extremely
Introduce more transparent classification procedures	40%	27%	27%	0%	7%	94% extremely to moderately
Introduce more objective vision tests	27%	40%	27%	0%	7%	94% extremely to moderately
Incorporate out of competition testing at centralised venues	20%	40%	33%	0%	7%	93% extremely to moderate
Include observation in classification	40%	27%	13%	0%	20%	80% extremely to moderately

Conclusion

This study aimed to gather expert opinion on the needs of a sport-specific classification system for VI football. It is the first study to systematically collect information from international experts to inform the direction for future experimental research in VI football and is the first step to building an evidence-based system of classification. In line with other VI sports, the panel did not believe that the current system fully meets the aim of classification - to minimise the impact of impairment on performance. However, issues identified have differed from other sports. For example, the panel strongly agreed that whether an impairment is acquired or congenital should not be accounted for in classification. This is in contrast to the opinions on the issue in previous work in other VI sport (Ravensbergen et al., 2018; Ravensbergen et al., 2016).

Vitally, this study outlines the two primary needs for modelling the impairment-performance relationship in VI football, namely, the aspects of visual function likely to impact performance, and the aspects of performance that are likely to be impacted (Mann & Ravensbergen, 2018). Figure 1 displays all measures of impairment the panel agreed would likely affect performance and all aspects of performance the panel agreed would likely be affected by VI. The relationships between these need to be established in future research to develop an understanding of the impairment-performance relationship and to develop an evidence-based system of classification.



514

515 Figure 1. Model for research to establish the impairment-performance relationship in
516 VI football. The model displays all measures of visual function and aspects of
517 performance that reached consensus in this study.

518

519 Figure 1 focuses on how visual function could affect performance in unadapted futsal.
520 This is because it is crucial for a single MIC to be established in research using the unadapted
521 form of a sport (Mann, & Ravensbergen, 2018). Using the unadapted version of the sport
522 allows researchers to establish the point at which a vision impairment causes a decrement to
523 performance in the sport, and at which an athlete should, therefore, be eligible for the VI

version of the sport. While these aspects of performance and visual function may appear more relevant for athletes with remaining vision, they also serve an important purpose for those with severe vision impairment. It is probable that, without any adaptation (e.g. sound in the ball), some athletes with severe vision impairment would not be able to perform these skills at all. If this is the case, it would produce evidence for a level of impairment at which athletes cannot compete with their sight (a potential class boundary). When investigating if more classes are needed within for players who cannot compete with sight, it may be necessary to identify different aspects of performance more relevant to an adapted version of the game.

Overall, the Delphi process has established opinion on a variety of further issues that will be important as the sport moves toward evidence-based classification. A considerable proportion of players and coaches suggested that they did not feel qualified to answer questions relating specific measures of vision to performance (e.g., the suitability of the current MIC, and the levels of impairment the impact performance). This exemplifies both the need for evidence of the impairment-performance relationship in football (Figure 1), as well as the need to improve education available to those involved in the sport on classification processes. A further key issue is the possibility that a group of eligible athletes who are the most impaired in the B2 class are currently unable to compete equitably in either of the current competitions. This issue should be addressed by future research that investigates sport classes, focusing on the two possible solutions that reached consensus (expansion of the current B1 class or a point system based B2/B3 game).

Further key issues, relevant to all current classes, centred on the procedures used during classification, such as the need for testing with both eyes and best correction, and the potential use of observation in classification. This was related to the issue of intentional misrepresentation, which the panel agreed does happen in VI football. This study offers a

starting point for future research to allow the VI version of the world's most popular sport to develop the required sport-specific evidence-based system, minimise the impact of impairment on performance, and attract a potentially new population of players to the game who may be discouraged by (perceived) disadvantages experienced using the existing classification system.

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